



INTERMOUNTAIN POWER SERVICE CORPORATION

Station Upate Operational Guidance Manual

III. Upate Project Operational Information

A. High Pressure Turbine Retrofit

Project Overview

The high pressure section of the main turbine is being replaced with a newer technology design. The design changes have shown, on Unit 2, to result in a section efficiency improvement of approximately 8.5%. The effect on output is an approximate 20 megawatt increase for the same steam flow.

The efficiency improvement in the HP section is produced by a combination of two design aspects. First; the addition of one extra stage of turbine blading. The addition of this stage allows a more effective distribution of the available energy in the steam at each stage. Second; 3 dimensional, larger, steam path blading that provides more effective turning of the steam with lower surface/end losses.

Initial Startup Issues

Turbine manufacturers are unable to produce turbine steam path components to greater than 2% accuracy in throat area. Therefore it may be necessary to adjust the throttle pressure setpoint during initial operation to achieve the desired 950MW output at an optimal valve position of approximately 50%.

A thermocouple is being installed at the upper, mid-span of the outer HP casing and at the lower mid-span. The top to bottom differential is primarily a concern during startup due to preferential heating of the outer HP turbine shell from both geometry and piping configurations. Excessive top/bottom preferential heating has been linked to HP section shell deformation and packing rubs.

At present, no specific guidelines have been established for our turbine regarding allowable top/bottom HP section outer shell temperature differentials. Tech. Services will be trending these inputs to provide Operations with additional information regarding the recommended temperature limits that should be maintained at these locations.